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EXAMINER	
VAN DOREN, BETH	
ART UNIT	**PAPER NUMBER**
3623	

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/814,308	PHILLIPS, ALAN PAUL ROLLESTON	
	Examiner	Art Unit	
	Beth Van Doren	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *20060313*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The following is a non-final office action in response to the communications received 03/13/2006. Applicant's arguments in this after-final communication were persuasive, and therefore the finality of office action dated 10/12/2005 has been withdrawn and prosecution has been reopened. Claims 18, 23, 24, and 25 have been amended. Claims 18-33 are pending.

Response to Amendment

2. Applicant's amendment to the title of the invention is sufficient to overcome the specification objection set forth in the previous office action. However, new specification objections have been set forth below.

Response to Arguments

3. Applicant's arguments, see pages 7-8, filed 03/15/2006, with respect to the rejections based on Aihara et al. (U.S. 2003/0065603) have been fully considered and are persuasive. Therefore, these grounds of rejection have been withdrawn.

Specification

4. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT

(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
(f) BACKGROUND OF THE INVENTION.
(1) Field of the Invention.
(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

5. The disclosure is objected to because of the following informalities: the specification does not contain section headings.

Appropriate correction is required.

Claim Objections

6. Claims 31-32 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

As per claim 31, claim 31 recites "a system controlled according to the method of claim 18". From this language, claim 31 is not required to include every limitation of parent claim 18, since the system of claim 31 may only receive the choice of claim 1 and then be an independent system. Thus, claim 31 may be infringed without claim 18 also being infringed.

The same holds true for claim 32, which recites "a robot controlled according to the method of claim 18". Again, the robot of claim 32 is not required to include every limitation of parent claim 18, since the robot may only receive a signal from claim 18 and the claim may be directed to the structure of the robot controlled. Thus, claim 32 may be infringed without claim 18 also being infringed.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 18-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 recites in the preamble, "A method for controlling a system to optimize an objective function thereof, the system being capable of performing a plurality of candidate actions and being capable of monitoring response performance [...], the method comprising". The body of the claim recites monitoring response performance, storing a representation of response performance, choosing a next candidate action to be performed, and repeating. Therefore, it is unclear as to how the method recited in the body of the claim accomplishes the controlling of a system, as set forth in the preamble. Examiner points out that the body of the claim contains no recitation that the candidate action is specifically performed, not does it contain any recitation that the performance of a candidate action or choosing a candidate action controls the system per se. Clarification is required. For examination purposes, it has been

construed that the chosen action of step c) in some way is implemented (and thus controls) a system.

Claim 27 recites "a method of controlling a system wherein the system comprises a robot". It is unclear as to how the inclusion of a robot relates to the recited method steps in the body of claim 18. Therefore, clarification is required. For examination purposes, it has been construed that the output of the method of claim 18 controls an external robot.

Claim 28 recites systems having ranks of control arranged in hierarchies and controlling said rank of control according to the steps of claim 18. The method recited in claim 18 make no reference to ranks of control or how the method specifically controls the system. Therefore, it is unclear as to how the method recited in the body of claim 18 would specifically implement and be effected by the limitations of claim 28. Clarification is required. For examination purposes, this claim has been construed using the specification, page 50, which discusses different controllers controlling interaction scenarios (i.e. the candidate actions) with different techniques, wherein the choice of with scenario to use is controlled by a ranking manager. Therefore, it is construed that one of multiple techniques is chosen to perform the method of claim 18.

Claim 29 depends for claim 28 and further recites this rank of control concept. Therefore, claim 29 contains the same deficiencies as claim 28.

Claim 31 recites a system controlled according to the method of claim 18. First, it is unclear as to what the structure of this system is as claim 18 does not include any system elements. Further, it is unclear as to whether the Applicant is claiming the system on which the method of claim 18 is implemented or a second system that is controlled by the method of claim

18. Clarification is required. For examination purposes, it has been construed that the system is the same system as that which runs the method of claim 18.

Claim 32 recites a robot controlled according to the method of claim 18. Since claim 18 does not recite the term robot, it is unclear as to how the elements of claim 18 specifically relate to claim 32. It is unclear as to whether the Applicant is claiming a robot on which the method of claim 18 is implemented or a robot that is separate and merely controlled by the method of claim 18. Further, it is unclear as to how the "method for controlling a system" specifically relates to the robot of claim 32. Clarification is required. For examination purposes, it has been construed that the robot is separate and merely controlled by the method of claim 18.

Claim 33 recites a control apparatus operating according to the method of claim 18. It is unclear as to what the elements of this apparatus are. Clarification is required.

Claims 19-26 and 29-30 depend from claim 18 and therefore contain the same deficiencies as claim 18.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claims 18-33 are rejected under 35 U.S.C. 101 because the claimed invention does not accomplish a practical application (i.e. a useful, concrete, and tangible result). To be useful, concrete, and tangible, the claimed invention must produce a real world outcome. However, with regards to claim 1, no such outcome is produced. Claim 1 recites monitoring response performance, storing this response performance, choosing an action next performed, and repeating the steps. However, none of these steps produces a real world outcome, as the chosen

action is not used or acted upon (i.e. nothing occurs after the choice is made, the steps merely repeat). Therefore, the invention of claim 18 lacks tangibility.

As for claims 31-32, the scope of the "candidate actions" is broad, based on the specification, so it is not guaranteed that the system and the robot controlled would produce a useful, concrete, and tangible result. See pages 16-17 and 24 of the specification which discloses the candidate actions of propositions (i.e. marketing propositions or product offerings) displayed on a website. See page 58-59, which discusses a distributed agent choosing the best candidate action. See page 59-60, which discloses robotics. See page 61, which discloses marketing as an example of candidate actions. Therefore, based on the scope of the term "candidate action", it is not guaranteed that the system and the robot controlled would produce a useful, concrete, and tangible result.

Claims 19-30 and 33 are dependent on claim 18 and contain the same deficiencies. Therefore, claims 19-30 are also rejected under 35 U.S.C. 101.

11. Because claims 28-29 are so indefinite, no art rejection is warranted as substantial guesswork would be involved in determining the scope and content of these claims. See In re Steele, 305 F.2d 859, 134 USPQ 292 (CCPA 1962); Ex parte Brummer, 12 USPQ 2d, 1653, 1655 (BdPatApp&Int 1989); and also In re Wilson, 424 F.2d 1382, 165 USPQ 494 (CCPA 1970). Prior art pertinent to the disclosed invention is nevertheless cited and applicants are reminded they must consider all cited art under Rule 111(c) when amending the claims to conform with 35 U.S.C. 112.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 18-21, 24-25, 30, 31, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merriman et al. (U.S. 2002/0099600) in view of Eppen et al. (*Quantitative Concepts for Management*).

As per claim 18, Merriman et al. teaches a method of controlling a system to optimize an objective function thereof, the system being capable of performing a plurality of candidate actions and being capable of monitoring response performances of a performance of a respective candidate action, the method comprising the steps of:

a) monitoring response performance of a respective candidate action that is chosen to be performed (See paragraphs 0010, 0015-6, 0033-4, wherein response to the action (direct advertising) is monitored);

b) storing, according to candidate action performed, a representation of said monitored response performance (See paragraph 0031, 0033, wherein historical data about the response to an action is stored in the historical database of the system);

c) choosing which of the plurality of candidate actions is next performed so as to optimize said objective function by assessing, using a predictive model, empirical data to determine which action will maximize feedback/minimize economic loss after the chosen candidate action is performed based on historical response performances to date (See paragraphs

0008, 0017-8, 0033, 0039, 0041-2, wherein an action is chosen based on the current known performance);

d) repeating steps a) to c) to substantially optimize the objective function of the system (See paragraph 0019, wherein the steps are iteratively repeated).

However, Merriman et al. does not expressly disclose optimizing said objective function by assessing, using the probability distribution of the response performance of all of said plurality of candidate actions, which candidate action is estimated to result in the lowest expected growth in regret after the chosen candidate action is performed, where regret is a term that represents a system performance measure that considers the relative merit of exploration of one or more apparently non-best candidate actions with respect to the relative merit of exploiting what appears to be the current best candidate action.

Eppen et al. discloses optimizing said objective function by assessing, using the probability distribution of the response performance of all of said plurality of candidate actions, which candidate action is estimated to result in the lowest expected growth in regret after the chosen candidate action is performed (See page 503, page 504, section 1, 511, section 1, wherein when the decision maker/software knows the probability distribution on the state of nature, regret could be minimized. See also page 512-513),

where regret is a term that represents a system performance measure that considers the relative merit of exploration of one or more apparently non-best candidate actions with respect to the relative merit of exploiting what appears to be the current best candidate action (See page 510-511, wherein regret represents the value of one of the non-best actions with respect to the

value of the current best action (i.e. regret is the opportunity cost of not making the best decision)).

Merriman et al. teaches a method and apparatus that considers past performance data when automatically determining the next action to take. Merriman et al. uses a predictive model with which to make a decision, the predictive model using past performance information to deliver optimal actions, thus maximizes utilization of the actions. Eppen et al. discloses the use of regret (or opportunity cost/lost) in the consideration of what action to take with respect to a group of actions based on a set of conditions. It would have been obvious to one of ordinary skill in the art at the time of the invention to use probability distributions and the theory of regret in the iterative predictive model of Merriman et al. in order to increase the efficiency of utilizing advertising/action space by providing a decision framework with which to analyze the various options. See paragraphs 0002, 0008, and 0010 of Merriman et al. and page 503 of Eppen et al.

As per **claims 19-21**, Merriman et al. discloses c) choosing which of the plurality of candidate actions is next performed so as to optimize said objective function by assessing, using a predictive model, empirical data to determine which action will maximize feedback/minimize economic loss after the chosen candidate action is performed based on historical response performances to date (See paragraphs 0008, 0017-8, 0033, 0039, 0041-2, wherein an action is chosen based on the current known performance). However, Merriman et al. does not expressly disclose and Eppen et al. discloses:

As per claim 19, that c) includes assessing which candidate action is likely to result in the lowest expected growth in regret on the basis of a true best candidate action which has the mean of said probability distribution (See page 510-511 and 512-513, wherein regret is assessed to

determine which action will result in the lowest regret using a probability distribution and expected values of regret);

As per claim 20, that step c) includes evaluating the cost or losses associated with presenting a lower performing candidate action and the gain or benefit associated with knowing the true position of the current best observed candidate action on said probability distribution (See page 510-511, wherein regret represents the value of one of the non-best actions with respect to the value of the current best action (i.e. regret is the opportunity cost of not making the best decision)).

As per claim 21, that step c) includes assessing which candidate action is likely to result in the lowest expected growth in regret according to an assumption that the current best observed candidate action is assumed to have zero uncertainty around its mean or expected response performance (See pages 510-11, wherein the candidate action with the expected least regret is represented by zero uncertainty).

Merriman et al. teaches a method and apparatus that considers past performance data when automatically determining the next action to take. Merriman et al. uses a predictive model with which to make a decision, the predictive model using past performance information to deliver optimal actions, thus maximizes utilization of the actions. Eppen et al. discloses the use of regret (or opportunity cost/lost) in the consideration of what action to take with respect to a group of actions based on a set of conditions. It would have been obvious to one of ordinary skill in the art at the time of the invention to use probability distributions and the theory of regret in the iterative predictive model of Merriman et al. in order to increase the efficiency of utilizing

advertising/action space by providing a decision framework with which to analyze the various options. See paragraphs 0002, 0008, and 0010 of Merriman et al. and page 503 of Eppen et al.

As per claim 24, Merriman et al. teaches e) applying a temporal depreciation factor to the stored representations of the response performance in order to depreciate the significance of the stored representations over time (See paragraph 0039, wherein a temporal time factor is applied to the actions).

As per claim 25, Merriman et al. wherein step e) includes applying, for each candidate action, a different temporal depreciation factor to the stored representations of the response performance thereof (See paragraph 0039, wherein a factor, such as a seasonal factor, is applied to actions to increase or decrease their relative importance in the problem).

As per claim 30, Merriman et al. discloses wherein the monitored response performance of a respective candidate action in step a) is stored in step b) in a form to enable use of the stored representation of said monitored response performance throughout different components (See paragraphs 0010-1, 0015-6, 0031, 0033-4, wherein the data collected in one component is stored via a server, the server transmitting the data to a component that makes the predictions for the system). However, neither Merriman et al. nor Eppen et al. specifically disclose storing data in a form to enable sharing of the stored representation of said monitored response performance with another system.

Merriman et al. and Eppen et al. are combinable for the reasons set forth above with regards to claim 18.

Further, Merriman et al. discloses storing data in a form that allows the data representing the monitored response performance to be used by different components. Open systems are well

known in the Information technology industry and are used to cause interoperability of the system. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use open systems architecture in the databases of Merriman et al. in order to increase the usability of the system and the system's data and functions with other system by implementing an interoperable framework.

As per claim 31, Merriman et al. discloses a system controlled according to the method of claim 18 (See figure 1, figure 3, paragraphs 0010-0011, wherein the "advertisement server" controls the system to display certain adds to the user).

As per claim 33, Merriman et al. discloses a control apparatus operating according to the method of claim 18 to control a system (See figure 1, paragraphs 0010, 0031, wherein a control apparatus is provided).

14. Claims 22 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merriman et al. (U.S. 2002/0099600) in view of Eppen et al. (*Quantitative Concepts for Management*) and in further view of McClave et al. (*A First Course in Business Statistics*).

As per claim 22, Merriman et al. discloses performing candidate actions (See paragraphs 0010, 0015-6, 0033-4). Merriman et al. further discloses assessing the candidate actions to choose which of the plurality of candidate actions to next performed so as to optimize said objective function by assessing, using a predictive model, which has the current expected best response performance (See paragraphs 0008, 0017-8, 0033, 0039, 0041-2, wherein an action is chosen based on the current known performance). However, Merriman et al. does not expressly disclose assessing which candidate action is likely to result in the lowest expected growth in

regret according to an assumption of a Student's distribution and evaluation of Student's t parameters as the basis for estimating probabilities of unequal or equal response states between the candidate action with the current expected best response performance and any other candidate action.

Eppen et al. discloses assessing, using the probability distribution of the response performance of all of said plurality of candidate actions, which candidate action is estimated to result in the lowest expected growth in regret after the chosen candidate action is performed, wherein the actions have unequal response states, based on the probability distribution, between the candidate action with the current expected best response performance and any other candidate action (See page 503, page 504, section 1, 511, section 1, wherein when the decision maker/software knows the probability distribution on the state of nature, regret could be minimized. See also page 512-513). Eppen et al. further discloses the situation where one does not know the specific probability distribution and therefore uses a known probability distribution, such as a minimax criterion, to select a decision that performs the best (See page 511, section 1).

However, Eppen et al. does not expressly disclose using a Student's distribution as the known probability distribution with Student's t parameters as the basis for estimating the probabilities.

McClave et al. discloses determining the distribution of the population using a Student's distribution with Student's t parameters (See pages 297-298).

Merriman et al. teaches a method and apparatus that considers past performance data when automatically determining the next action to take. Merriman et al. uses a predictive model

with which to make a decision, the predictive model using past performance information to deliver optimal actions, thus maximizes utilization of the actions. Eppen et al. discloses the use of regret (or opportunity cost/lost) in the consideration of what action to take with respect to a group of actions based on a set of conditions. It would have been obvious to one of ordinary skill in the art at the time of the invention to use probability distributions and the theory of regret in the iterative predictive model of Merriman et al. in order to increase the efficiency of utilizing advertising/action space by providing a decision framework with which to analyze the various options. See paragraphs 0002, 0008, and 0010 of Merriman et al. and page 503 of Eppen et al.

Further, Eppen et al. discloses using a probability distribution associated with the state of nature (i.e. possible outcomes). McClave et al. discloses determining the sample distribution to make reliable decisions using a Student's distribution with t statistics. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a Student's distribution as the distribution in Eppen et al. in order to increase the confidence and reliability of the prediction output by the system, thus decreasing the possibility of opportunity loss. See pages 297-298 of McClave et al. and pages 511-12 of Eppen et al.

As per claim 26, Merriman et al. teaches performing candidate actions (See paragraphs 0010, 0015-6, 0033-4). However, Merriman et al. does not expressly disclose forcing the performance of each candidate action a minimum number of times or at a minimum rate.

Eppen et al. discloses using the probability distribution of the response performance of all of said plurality of candidate actions (See page 503, page 504, section 1, 511, section 1, wherein when the decision maker/software knows the probability distribution on the state of nature, regret could be minimized. See also page 512-513). However, Eppen et al. does not expressly disclose

forcing the performance of each candidate action a minimum number of times or at a minimum rate.

McClave et al. discloses determining the sample size needed to make reliable decisions, and thus forcing a sampling of that minimum number of estimates (See pages 316-318, which discusses making a certain number of observations).

Merriman et al. teaches a method and apparatus that considers past performance data when automatically determining the next action to take. Merriman et al. uses a predictive model with which to make a decision, the predictive model using past performance information to deliver optimal actions, thus maximizes utilization of the actions. Eppen et al. discloses the use of regret (or opportunity cost/lost) in the consideration of what action to take with respect to a group of actions based on a set of conditions. It would have been obvious to one of ordinary skill in the art at the time of the invention to use probability distributions and the theory of regret in the iterative predictive model of Merriman et al. in order to increase the efficiency of utilizing advertising/action space by providing a decision framework with which to analyze the various options. See paragraphs 0002, 0008, and 0010 of Merriman et al. and page 503 of Eppen et al.

Further, Eppen et al. discloses using a probability distribution associated with the state of nature (i.e. possible outcomes). McClave et al. discloses determining the sample size needed to make reliable decisions, and thus forcing a sampling of that minimum number of estimates. It would have been obvious to one of ordinary skill in the art at the time of the invention to determine an appropriate sample size of candidate actions and force this number of candidate actions to occur in order to increase the confidence and reliability of the prediction output by the

system, thus decreasing the possibility of opportunity loss. See pages 316-318 of McClave et al. and pages 511-12 of Eppen et al.

15. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Merriman et al. (U.S. 2002/0099600) in view of Eppen et al. (*Quantitative Concepts for Management*) and in further view of Jameson (U.S. 6,032,123).

As per claim 23, Merriman et al. discloses c) choosing which of the plurality of candidate actions is next performed so as to optimize said objective function by assessing, using a predictive model, empirical data to determine which action will maximize feedback/minimize economic loss after the chosen candidate action is performed based on historical response performances to date (See paragraphs 0008, 0017-8, 0033, 0039, 0041-2, wherein an action is chosen based on the current known performance). However, Merriman et al. does not expressly disclose using a Monte Carlo algorithm to provide understanding of the probability distribution of the response performance of all of the plurality of candidate actions and choosing a candidate action with probability proportional to its contribution to the expected regret estimate.

Eppen et al. discloses using a probability distribution of the response performance of all of said plurality of candidate action to provide an understanding of response performance and choosing a candidate action with its likelihood proportional to its contribution to the regret (See pages 511-513, wherein expected regret of each action is proportional to its contribution to regret. See specifically page 513, section 1). However, Eppen et al. does not expressly disclose using a Monte Carlo algorithm to provide understanding of the probability distribution of the response performance of all of the plurality of candidate actions.

Jameson discloses using a Monte Carlo algorithm to provide understanding using "what if" simulation to facilitate analysis of the response performance of candidate actions (See abstract, column 29, line45-column 30, line 10, wherein Monte Carlo simulation is used on user defined distributions to optimize outputs by simulating potential scenarios).

Merriman et al. teaches a method and apparatus that considers past performance data when automatically determining the next action to take. Merriman et al. uses a predictive model with which to make a decision, the predictive model using past performance information to deliver optimal actions, thus maximizes utilization of the actions. Eppen et al. discloses the use of regret (or opportunity cost/lost) in the consideration of what action to take with respect to a group of actions based on a set of conditions. It would have been obvious to one of ordinary skill in the art at the time of the invention to use probability distributions and the theory of regret in the iterative predictive model of Merriman et al. in order to increase the efficiency of utilizing advertising/action space by providing a decision framework with which to analyze the various options. See paragraphs 0002, 0008, and 0010 of Merriman et al. and page 503 of Eppen et al.

Further, Eppen et al. discloses using a probability distribution associated with the state of nature (i.e. possible outcomes) to predict expected outcomes of regret. Jameson discloses using a Monte Carlo algorithm on user defined distributions to provide understanding of potential outcomes of action using "what if" simulation. It would have been obvious to one of ordinary skill in the art at the time of the invention to determine use Monte Carlo simulation on the defined distribution of Eppen et al. in order to increase the confidence and reliability of the prediction output by understanding better understanding the likelihood of potential outcomes

through "what-if" analysis, thus decreasing the possibility of opportunity loss. See abstract of Jameson and pages 511-12 of Eppen et al.

16. Claims 27 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merriman et al. (U.S. 2002/0099600) in view of Eppen et al. (*Quantitative Concepts for Management*) and in further view of Strickland et al. (U.S. 5,790,407).

As per claims 27 and 32, Merriman et al. and Eppen et al. disclose the method and system, as set forth above in the rejection of claim 18. Therefore these elements are rejected using the same art and rationale as relied upon above in the rejcection of claim 18. However, neither Merriman et al. nor Eppen et al. disclose the system comprises a robot, the robot controlled according to the method of claim 18.

Strickland discloses control systems for controlling external devices, such as robots, by comparing the response profile of the device to the actual response of the device (See abstract, column 1, lines 15-30, column 3, line 62-column 4, line 15 and lines 20-35).

Merriman et al. and Eppen et al. are combinable for the reasons set forth above with regards to claim 18.

Further, Merriman et al. teaches a method and apparatus that considers past performance data when automatically determining the next action to take. Strickland discloses determining the next action to take when controlling external devices, such as robots, by comparing the response profile of the device to the actual response of the device. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the method for control of Merriman et al. to determine the optimal output for an external device, such as a robot, in order

to more accurately produce an optimal output for a device by providing a model with which to analyze the various options. See paragraphs 0002, 0008, and 0010 of Merriman et al.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Masch (U.S. 5,930,762) discloses constructing candidate strategies and using optimization models, where an outcome matrix is analyzed, the outcome matrix includes a regret matrix.

Takeuchi et al. (U.S. 6,466,894) discloses methods for predicting a probability of an occurrence and calculating loss as a performance measure

Chavez et al. (U.S. 6,684,193) discloses analyzing opportunity loss.

Lange (U.S. 6,321,212) discloses a central control system that establishes predefined states and analyzes possible outcomes of each state in terms of payout.

Masch (WO 98/13776) develops in computer memory a multitude of candidate strategies, describes the strategies in computer memory in formats of multidimensional outcome and regret matrices, and applies optimization criteria to these matrices.

Gardner et al. ("Current Risk in International Portfolios") discloses regret and managing exposure to regret by using expected values.

Pfaffenberger et al. (*Statistical Methods*) disclose regret tables and methods to measure loss functions.

"Taguchi's Loss Function" (www.mv.com/ipusers/rm/loss.htm) discloses loss functions and their impact on satisfaction/dissatisfaction.

Faddoul et al. ("The impact of mixture distributions in classical process capability analysis") discloses regret functions and the estimated loss using this function.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Beth Van Doren whose telephone number is (571) 272-6737. The examiner can normally be reached on M-F, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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bvd
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